

Challenges Confronted by Coaches in Evaluation of Pediatric Athletes: Awareness on Pediatric Sports Medicine

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What is already known on this topic?

- Since pediatric and adolescent athletes are not simply "small" adults, their follow-up should be performed by pediatricians.
- Due to absence of a specific department, pediatric and adolescent athletes experience injuries as a result of inappropriate training and injury management.
- The department "Pediatric Sports Medicine," which exists in the United States and some parts of Europe, has not yet been established.

What does this study add on this topic?

- Coaches admit that they do not know where to refer the pediatric and adolescent athletes and therefore refer them to different departments for various reasons.
- Of the coaches, 90.1% think that the establishment of Pediatric Sports Medicine would definitely make contribution.
- Of the coaches, 94.9% support the establishment of Pediatric Sports Medicine in affiliation with Department of Pediatrics.

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ABSTRACT

Objective: There are numerous athletes under 18 years of age in our country, whose physical, psychosocial and athletic developments have become more of an issue. The aim was to determine challenges confronted by coaches of pediatric athletes in the referral of pediatric athletes for preparticipation medical clearance, management of injuries, pre- and postparticipation follow-up, and opinions of coaches about whether establishment of Pediatric Sports Medicine (PSM) would be warranted.

Materials and Methods: This questionnaire addressed coaches' age, sex, the sport branch they were dealing with, physicians to whom they refer pediatric athletes, challenges experienced with the athlete and his/her parents during preparticipation evaluation (PPE), challenges experienced by parents during PPE, suggested branch for referral, awareness of coaches on PSM abroad, and their opinions on interests of PSM and establishment of PSM in our country.

Results: A total of 352 coaches were included. The most common branch of coaching was football (21.4%). The most common physicians they were referring to were sports medicine specialists (52.0%), family medicine specialists (44.9%), general pediatricians (33.8%), and pediatric cardiologists (29.3%). Of the participants, 69.0% had never heard about PSM. Regarding areas of interest of PSM, 55.1% stated they had no idea, 37.5% routine follow-up and 25.0% physical examination of pediatric athletes. Of the participants, 90.1% stated that establishment of PSM in our country would definitely contribute to PPE, and 94.9% stated that it should definitely be established.

Conclusion: It was concluded that awareness on PSM is low among coaches and that the establishment of PSM would definitely make contribution in Türkiye.

Keywords: Pediatric athlete, pediatric sports medicine, pediatrician, preparticipation physical evaluation

INTRODUCTION

There are numerous athletes under 18 years of age in our country, whose physical, psychosocial and athletic developments have become more of an issue. Athletes under 18 years of age require a more specific and organized approach since athletes under 18 years of age are children, and, unlike adult athletes, they continue to grow and develop throughout childhood; anatomical, physiological, and anthropometrics, as well as the protocols used for exercise testing and the measured parameters differ. Pediatric Sports Medicine (PSM) specialists deal not only with injuries but also with sports-related medical issues.¹

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In the United States and some parts of Europe, their follow-up is carried out by PSM, which is a division of the Department of Pediatrics^{2,3} and does not exist in our country. The aim was to establish the Division of PSM in our university. It was thus aimed to ensure appropriate supervision by coaches, as well as healthy growth and development, and appropriate medical care by pediatric sports medicine specialists in order to provide follow-up of pediatric athletes and their recovery from traumatic processes with minimal damage, contributing to advancement of sports in Turkey by developing sports and athletic health and the continuity of success.

With this study, it was aimed to determine the challenges confronted by coaches of pediatric athletes regarding where to refer these athletes for obtaining pre-participation medical clearance, management of injuries, pre- and postparticipation follow-up, and opinions of coaches about whether establishment of Division of PSM would be warranted in terms of legal responsibilities. For this purpose, an online survey study was carried out with coaches across Türkiye.

MATERIALS AND METHODS

Study Design

This study was conducted as a cross-sectional epidemiological study after approval from the local ethics committee of Necmettin Erbakan University was obtained (decision no: 2024/5245, Date: October 4, 2024). The questionnaire was formed using Google Forms after a literature review. It was conveyed to coaches across Türkiye, particularly from metropolitan regions, through face-to-face meetings, emails, and social media accounts, and comprised 12 questions, first 5 addressed coaches' age, sex, and the sport branch they were dealing with, and the remaining 7 addressed to which specialties they refer pediatric athletes, challenges experienced with the athlete and his/her parents during preparticipation evaluation, challenges experienced by parents during the preparticipation evaluation process, the branch to which coaches think pediatric athletes should be referred, awareness of coaches on PSM fellowship abroad, and their opinions on interests of PSM and establishment of PSM fellowship in our country. The study was conducted with coaches of pediatric athletes across Türkiye between October 5, 2024, and November 5, 2024. A total of 352 coaches who gave consent participated in this survey study. Moreover, this study was presented as an oral presentation while recruitment of the participants was ongoing at the 4th Cerrahpaşa Pediatrics Days (December 13–14, 2024).

Statistical Analysis

The study data was transferred to an electronic medium. The data analysis was performed using The Package for Social Sciences 18.0 for Windows (SPSS Inc.; Chicago, IL, USA). Categorical data were summarized as frequency and percentage, whereas numerical data were expressed as mean \pm standard deviation and median (minimum–maximum) values.

RESULTS

A total of 352 coaches with a mean age of 33.00 ± 8.16 years, 69.0% of which were male, were included. The branch of coaching was football in 21.4%, swimming in 19.9% and volleyball in 16.1% (Table 1).

The most common physicians to which pediatric athletes were referred by coaches for preparticipation evaluation were found to be sports medicine specialists (52.0%), family medicine specialists (44.9%), general pediatricians (33.8%), pediatric cardiologists (29.3%), orthopedists (14.2%), and emergency departments (5.4%). Furthermore, of the coaches, 66.5%, 40.9% and 37.8% stated that preparticipation medical clearance reports should be issued by sports medicine specialists, pediatricians and pediatric cardiologists, respectively (Table 2).

Of the coaches, 57.4% reported that parents complain where to admit to get preparticipation medical clearance, and 31.8% reported that parents do not find the medical clearance provided satisfactory and concern about their child's health. As reported by the coaches, the most common challenges experienced by the parents in healthcare facilities were scheduling appointments for procedures such as electrocardiography (ECG) and treadmill tests ahead of time (48.0%), difficulties in making appointments for visits (42.0%), lack of interest in healthcare facilities (42.0%), receiving no definitive answer to which department they should admit for routine follow-up (30.4%), and unsatisfactory responses to the questions they ask (30.4%) (Table 3).

Of the participants, 69.0% had never heard about PSM fellowship in affiliation with Department of Pediatrics. Regarding areas of interest of PSM, 55.1% stated they had no idea, 37.5% routine follow-up and 25.0% physical examination of pediatric athletes. Of the participants, 90.1% stated that establishment of Division of PSM in our country would definitely contribute to preparticipation evaluation, and 94.9% stated that Division of PSM in affiliation with Department of Pediatrics should definitely be established (Table 4).

Table 1. Demographic and Professional Features of the Participants

Feature	All Participants (n = 352)
Age/mean \pm SD	33.00 \pm 8.16
Sex/n (%)	
Female	109 (31.0)
Male	243 (69.0)
Sport branch of coaching (%)*	
Football	81 (21.4)
Swimming	78 (19.9)
Volleyball	63 (16.1)
Basketball	49 (12.5)
Tennis	20 (5.1)
Handball	15 (3.8)
Box	13 (3.3)
Judo	13 (3.3)
Athletics	11 (2.8)
Gymnastics	10 (2.6)
Wrestling	9 (2.3)
Fitness	9 (2.3)
Water Polo	9 (2.3)
Taekwondo	9 (2.3)
Other (Shooting, Weightlifting, Plates, Pickleball etc.)	31 (7.9)

*Some participants chose more than one.

Table 2. Departments Where They Are Most Commonly Referred to and Suggested Departments for Preparticipation Medical Clearance

Questions/n (%)	All Participants (n = 352)
What is the most common department to which you refer the pediatric athlete you coach?*	
Sports medicine	183 (52.0)
Family medicine	158 (44.9)
Pediatrics	119 (33.8)
Pediatric cardiology	103 (29.3)
Orthopedics	50 (14.2)
Emergency department	19 (5.4)
Which department do you suggest for preparticipation medical clearance of the pediatric athlete you coach?*	
Sports medicine	234 (66.5)
Pediatric cardiology	133 (37.8)
General pediatrics	144 (40.9)
Family medicine	93 (26.4)
Orthopedics	58 (16.5)

*Some participants chose more than one.

DISCUSSION

Follow-up of pediatric athletes is performed by Pediatric Sports Medicine (PSM) specialists in the United States and some parts of Europe, which is mostly carried out mostly by family physicians in Türkiye. In this regard, this study is the first to evaluate awareness of PSM among coaches of pediatric athletes and the potential contribution of its establishment in Türkiye.

Across all levels of sport, coaches are integral in the lives of athletes⁴⁻⁶ and the roles of coaches in the physical and mental health of the athletes have been investigated in previous studies.⁷ This study was, therefore, conducted with coaches of pediatric athletes. There are currently fewer female coaches than male coaches in sports at all levels across the world,⁸ with the greatest discrepancy found in the “high performance” level of the sport.⁹

A total of 352 coaches with a mean age of 33.00 ± 8.16 years, 69.0% of which were male, were included. The male

predominance is consistent with the literature. The branch of coaching was football in 21.4%, swimming in 19.9% and volleyball in 16.1%. Since these sports are among the most commonly played sports in Türkiye and all over the World,¹⁰⁻¹² the results are consistent with the literature. Furthermore, some participants also reported relatively novel sport branches such as Pickleball, which has recently been played worldwide but has newly become popular in Türkiye.¹³

The most common physicians to which pediatric athletes were referred by coaches for preparticipation evaluation were found to be sports medicine specialists (52.0%), family medicine specialists (44.9%), general pediatricians (33.8%), pediatric cardiologists (29.3%), orthopedists (14.2%), and emergency departments (5.4%). Since the department of “Pediatric Sports Medicine,” which does exist in the United States and Europe, has not yet been established in our country,^{2,3} the pediatric athletes are compulsorily referred to sports medicine specialists, who are the only medical professionals dealing with sports in Türkiye. Family medicine specialists, particularly those working at family health centers, are those examining pediatric and adolescent athletes and issuing preparticipation clearance reports in Türkiye.¹⁴ Therefore, pediatric athletes are most commonly referred to these two specialists. Cardiovascular events in athletes are the most worrisome conditions for coaches, athletes, and their parents,¹³ and since coaches lack the knowledge of where to refer pediatric athletes, they refer to different departments for different reasons: to sports medicine specialists and orthopedists for injuries, to general pediatricians for normal growth and development, and to pediatric cardiologists for cardiac examination. This forms a significant financial burden on healthcare system and causes confusion for both coaches and parents. These are all covered by Pediatric Sports Medicine specialists in the UnS and the Europe,^{2,3} the establishment of which is expected to reduce both the physical and financial burden on healthcare system. Moreover, majority of the coaches most commonly preferred sports medicine specialists, pediatricians and pediatric cardiologists as the suggested physicians for preparticipation evaluation. Since children and adolescents are not just “small” adults, their vital signs, responses to exercise, growth, and development significantly differ, so they should be followed up, examined, and treated by

Table 3. Challenges Confronted by Coaches with Pediatric Athletes and Their Parents

Questions/n (%)	All Participants (n = 352)
What kind of problems do you have with the parents of the pediatric athlete you coach during preparticipation evaluation?*	
Parents complain that they do not know where to go to get preparticipation medical clearance	202 (57.4)
Some parents are not satisfied with the medical clearance given and are concerned about their child's health	112 (31.8)
It is sometimes difficult for me to answer the questions of the parents regarding the health of the pediatric athlete	51 (14.5)
I do not know where to refer	46 (13.1)
According to you, what are the challenges the parents of pediatric athletes experience during health controls in healthcare facilities?*	
Receiving no definitive response about where to admit for routine follow-up	107 (30.4)
Difficulties in getting appointments for visits	148 (42.0)
Lack of interest in healthcare facilities	148 (42.0)
Scheduling appointments for procedures such as ECG and treadmill tests ahead of time	169 (48.0)
Unsatisfactory responses to the questions they ask	102 (30.4)

*Some participants chose more than one.

Table 4. Distribution of Answers Given by Participants to Questions Regarding “Pediatric Sports Medicine”

Questions/n (%)	All Participants (n = 352)
Have you ever heard that the Division of PSM in affiliation with Department of Pediatrics, exists abroad?	
Yes	109 (31.0)
No	243 (69.0)
What are the interests of PSM that exists abroad?*	
No idea	194 (55.1)
Routine medical follow-up of pediatric athletes (growth development, psychological development etc.)	132 (37.5)
Physical examination of pediatric athletes	88 (25.0)
Providing clearance after recovery from injury	67 (19.0)
Evaluation of athletic performance of pediatric athletes	66 (18.8)
Medical treatment of injuries of pediatric athletes	79 (22.4)
Providing counseling services for parents of pediatric athletes	48 (13.6)
Working as a team physician for pediatric athletes	25 (7.1)
Doping in pediatric athletes	15 (4.3)
What is your opinion about whether the establishment of Division of PSM in our country would contribute to preparticipation evaluation process of pediatric athletes?	
Will definitely contribute	317 (90.1)
Not sure	25 (7.1)
Will not make difference	10 (2.8)
What is your opinion about the establishment of Division of PSM, which does not exist in our country, in affiliation with Department of Pediatrics in our country?	
Should be definitely established	334 (94.9)
No idea	13 (3.7)
Not necessary	5 (1.4)
*Some participants chose more than one.	

pediatricians. Due to the lack of a pediatric department dealing with sports, pediatric and adolescent athletes are commonly referred to general pediatricians and, due to concerns about cardiac events, to pediatric cardiologists. This also indicates the need for establishment of PSM to ensure appropriate follow-up and management of pediatric and adolescent athletes and to facilitate the preparticipation evaluation process.

Of the coaches, 57.4% reported that parents complain where to admit to get preparticipation medical clearance, and 31.8% reported that parents do not find the medical clearance provided satisfactory and concern about their child's health. As reported by the coaches, the most common challenges experienced by the parents in healthcare facilities were scheduling appointments for procedures such as electrocardiography (ECG) and treadmill tests ahead of time (48.0%), difficulties in making appointments for visits (42.0%), lack of interest in healthcare facilities (42.0%), receiving no definitive answer to which department they should admit for routine follow-up (30.4%), and unsatisfactory responses to the questions they ask (30.4%). The process of preparticipation evaluation in Türkiye is challenging and exhausting for coaches, physicians, and parents. Since there is no specific department established for this purpose,¹⁵ coaches do not know which department to refer to, and the pediatric athletes are usually referred to several departments for examination and receiving preparticipation medical clearance. This causes increased workload and uproar in healthcare facilities, which could be reduced by the establishment of a PSM. Moreover, evaluation of pediatric athletes by a pediatric sports medicine specialist will reassure their parents and provide proper answers to the questions asked by the parents.

Physicians seeing pediatric athletes must be prudent in seeking to protect them from sports-related violence and traumas.^{16,17} Sports readiness is the process during which the child matures to learn given tasks and acquires required abilities to meet the demands of a given sport, such as motor, cognitive, social, physical, psychological, and adaptive abilities.^{18–20} Of the participants, 69.0% had never heard about PSM fellowship in affiliation with Department of Pediatrics. In regard to areas of interest of PSM, 55.1% stated they had no idea, 37.5% routine follow-up and 25.0% physical examination of pediatric athletes. Of the participants, 90.1% stated that establishment of Division of PSM in our country would definitely contribute to preparticipation evaluation, and 94.9% stated that Division of PSM in affiliation with Department of Pediatrics should definitely be established.

Study Limitations

The relatively small size of the study sample is a limitation of the study. Second, due to the absence of an establishment called “Pediatric Sports Medicine”, there is limited literature data to compare with these results. Third, the fact that the survey could not have been conveyed to all coaches across Türkiye and the voluntary participation in the survey restricts generalization of the results.

CONCLUSION

These results indicate that awareness on PSM is low among coaches in Türkiye, who are among the most commonly dealing with pediatric athletes, and that the establishment of PSM in affiliation with Department of Pediatrics would definitely make contribution. Likewise, the authors support the establishment of

PSM for an integrative approach and, for this reason, conduction of more studies including a higher number of participants is warranted.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: This study was approved by the Ethics Committee of Necmettin Erbakan University (approval no: 2024/5245, date: October 4, 2024).

Informed Consent: Written informed consent was obtained from the participants who agreed to take part in the study.

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